



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2022-0126; Special Conditions No. 25-809-SC]

Special Conditions: Dassault Aviation Model Falcon 6X Airplane; Operation without Normal Electrical Power

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Dassault Aviation (Dassault) Model Falcon 6X airplane. This airplane will have a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. This design feature is an electronic flight-control system installation that establishes the criticality of the electrical power generation and distribution systems, such that the loss of all electrical power may be catastrophic to the airplane. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: This action is effective on Dassault on [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Send comments on or before [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: Send comments identified by Docket No. FAA-2022-0126 using any of the following methods:

- *Federal eRegulations Portal:* Go to <https://www.regulations.gov/> and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, DC, 20590-0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* Fax comments to Docket Operations at 202-493-2251.

Privacy: Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in title 14, Code of Federal Regulations (14 CFR) 11.35, the FAA will post all comments received without change to <https://www.regulations.gov/>, including any personal information you provide. The FAA will also post a report summarizing each substantive verbal contact received about these special conditions.

Confidential Business Information: Confidential Business Information (CBI) is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to these special conditions contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to these special conditions, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and the indicated comments will not be placed in the public docket of these special conditions. Send

submissions containing CBI to the Information Contact below. Comments the FAA receives, which are not specifically designated as CBI, will be placed in the public docket for these special conditions.

Docket: Background documents or comments received may be read at <https://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Dan Poblete, Aircraft Systems, AIR-623, Technical Innovation Policy Branch, Policy and Innovation Division, Aircraft Certification Service, Federal Aviation Administration, 3960 Paramount Boulevard, Suite 100, Lakewood, California 90712; telephone 562-627-5335, fax 562-627-5210; e-mail daniel.d.poblete@faa.gov.

SUPPLEMENTARY INFORMATION: The substance of these special conditions has been published in the *Federal Register* for public comment in several prior instances with no substantive comments received. Therefore, the FAA finds that, pursuant to § 11.38(b), new comments are unlikely, and notice and comment prior to this publication are unnecessary.

Comments Invited

The FAA invites interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

The FAA will consider all comments received by the closing date for comments. The FAA may change these special conditions based on the comments received.

Background

On July 1, 2012, Dassault Aviation applied for a type certificate for its new Model Falcon 5X airplane. However, Dassault has decided not to release an airplane under the model designation Falcon 5X, instead choosing to change that model designation to Falcon 6X.

In February of 2018, due to engine supplier issues, Dassault extended the type certificate application date for its Model Falcon 5X airplane under new Model Falcon 6X. This airplane is a twin-engine business jet with seating for 19 passengers, and has a maximum takeoff weight of 77,460 pounds.

Type Certification Basis

Under the provisions of 14 CFR 21.17, Dassault must show that the Model Falcon 6X airplane meets the applicable provisions of part 25, as amended by amendments 25-1 through 25-146.

If the Administrator finds that the applicable airworthiness regulations (e.g., 14 CFR part 25) do not contain adequate or appropriate safety standards for the Dassault Model Falcon 6X airplane because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design feature, these special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Dassault Model Falcon 6X airplane must comply with the fuel-vent and exhaust-emission requirements of 14 CFR part 34, and the noise-certification requirements of 14 CFR part 36.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The Dassault Model Falcon 6X airplane will incorporate the following novel or unusual design features:

An electronic flight-control system installation that establishes the criticality of the electrical power generation and distribution systems, such that the loss of all electrical power may be catastrophic to the airplane.

Discussion

The Dassault Aviation Model Falcon 6X airplane will have a fly-by-wire control system that requires a continuous source of electrical power to maintain an operable flight-control system. Section 25.1351(d), “Operation without normal electrical power,” requires safe operation for at least five minutes, in visual flight rules (VFR), with normal power inoperative. This rule was structured around a traditional design, with mechanical control cables for flight control, while flightcrew considered the electrical failures, attempted to start engines(s) if necessary, and attempted to re-establish some of the electrical-power-generation capability.

Changes in technology have produced advanced electrical and electronic airplane systems that requires a continuous source of electrical power to maintain an operable flight-control system. The Dassault Model Falcon 6X airplane design must not be time-limited in its operation, including being without the normal source of electrical power generated from engine generators or auxiliary power unit (APU), to maintain the same level of safety associated with traditional designs.

Airplane service experience has shown that the loss of all electrical power, as generated by the airplane’s engine generators or APU, is not extremely improbable. Therefore, the applicant must demonstrate that the airplane maintains safe flight and

landing, including steering and braking on the ground with the use of airplane emergency electrical-power systems. These emergency electrical-power systems must be able to provide power to loads required for continued safe flight and landing.

These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

Applicability

As discussed above, these special conditions are applicable to the Dassault Model Falcon 6X airplane. Should Dassault apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, these special conditions would apply to that model as well.

Conclusion

This action affects only a certain novel or unusual design feature on one model of airplane. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

Authority Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Dassault Aviation Model Falcon 6X airplanes.

In lieu of the requirements of 14 CFR 25.1351(d), the following special conditions apply:

- (a) The applicant must show, by test or a combination of test and analysis, that the airplane is capable of continued safe flight and landing with all normal electrical power sources inoperative, as prescribed by paragraphs (b)(1) and (b)(2) below. For purposes of this special condition, normal sources of electrical-power generation do not include alternate power sources such as a battery, ram-air turbine, or independent power systems such as a flight-control permanent-magnet generating system.
- (b) The airplane is demonstrated to be capable of continued safe flight and landing by ensuring the performance of the systems capability, effects on crew workload and operating conditions, and the physiological needs of the flightcrew and passengers meet the requirements for the longest diversion time for which approval is sought.
- (1) Common-cause failures, cascading failures, and zonal physical threats must be considered in showing compliance with this requirement.
- (2) The ability to restore operation of portions of the electrical-power generation and distribution system may be considered if it can be shown that unrecoverable loss of those portions of the system is extremely improbable. An alternative source of electrical power must be provided for the time required to restore the minimum electrical-power-generation capability required for safe flight and landing. Unrecoverable loss of all engines may be excluded when showing that unrecoverable loss of critical portions of the electrical system is extremely improbable. Unrecoverable loss of all engines is covered in special condition (c), below, and thus may be excluded when showing compliance with this requirement.
- (c) Regardless of any electrical-generation and distribution-system recovery capability shown under special condition (a), above, sufficient electrical-system capability must be provided to:

- (1) Allow time to descend, with all engines inoperative, at the speed that provides the best glide distance, from the maximum operating altitude to the altitude at the top of the engine restart envelope, and
 - (2) Subsequently allow multiple start attempts of the engines and APU. This capability must be provided in addition to the electrical capability required by existing part 25 requirements related to operation with all engines inoperative.
- (d) The airplane emergency electrical-power system must be designed to supply electrical power required for:
- (1) Immediate safety, which must continue to operate without the need for flightcrew action following the loss of the normal electrical power, for a duration sufficient to allow reconfiguration to provide a non-time-limited source of electrical power.
 - (2) Continued safe flight and landing for the maximum diversion time.
- (e) If APU-generated electrical power is used in satisfying the requirements of these special conditions, and if reaching a suitable runway upon which to land is beyond the capacity of the battery systems, then the APU must be able to be started under any foreseeable flight condition prior to the depletion of the battery or the restoration of normal electrical power, whichever occurs first. Flight tests must demonstrate this capability at the most critical condition.
- (1) The applicant must show that the APU will provide adequate electrical power for continued safe flight and landing.
 - (2) The Airplane Flight Manual (AFM) must incorporate non-normal procedures that direct the pilot to take appropriate actions to activate the APU after loss of normal engine-generated electrical power.

(f) As a part of showing compliance with these special conditions, the tests by which loss of all normal electrical power is demonstrated must also take into account the following:

- (1) The failure condition should be assumed to occur during night instrument meteorological conditions (IMC), at the most critical phase of the flight, relative to the worst possible electrical-power distribution and equipment-loads-demand condition.
- (2) After the un-restorable loss of normal engine-generated electrical power, the airplane-engine-restart capability must be provided and operations continued in IMC.
- (3) The applicant must demonstrate that the aircraft is capable of continued safe flight and landing. The length of time must be computed based on the maximum diversion-time capability for which the airplane is being certified. Consideration for airspeed reductions resulting from the associated failure or failures must be made.
- (4) The airplane must provide adequate indication of loss of normal electrical power to direct the pilot to the non-normal procedures, and the AFM must incorporate non-normal procedures that will direct the pilot to take appropriate actions.

Issued in Kansas City, Missouri, on February 22, 2023.

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